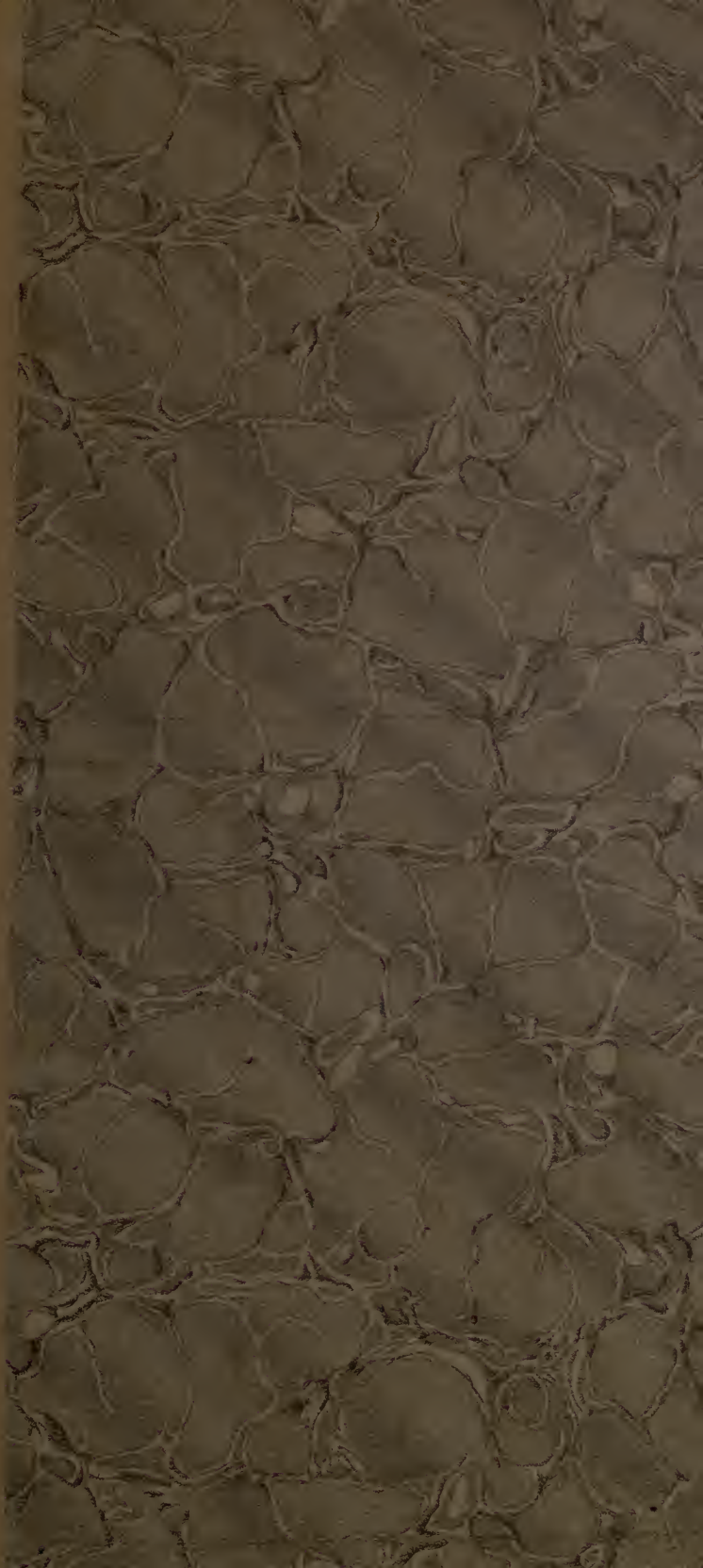
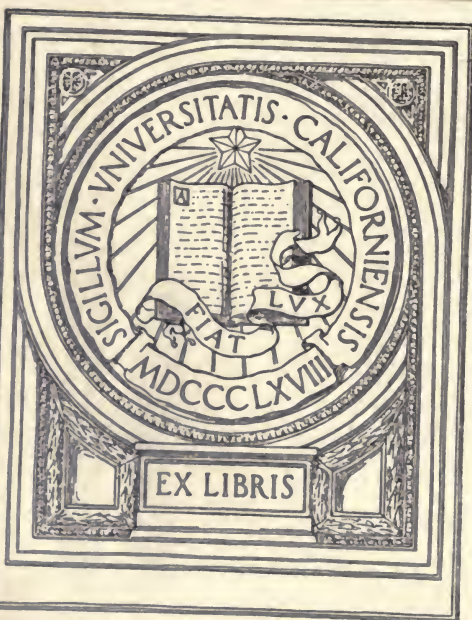


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PRE-COLUMBIAN COPPER MINING IN NORTH AMERICA.

by

R. L. Packard.





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## PRE-COLUMBIAN COPPER MINING IN NORTH AMERICA.

BY R. L. PACKARD, WASHINGTON, D. C.

The broad classification of the successive stages of culture of the prehistoric peoples of Europe into the stone, bronze and iron "ages" was based upon prehistoric finds, and is an induction derived from observation similar to that relating to the succession of the different orders of animals and plants in geological history. It is also confirmed, as far as bronze and iron are concerned, by ancient tradition, for in early historical times it was known among the Greeks that bronze had preceded iron at an earlier period, and this knowledge, passing to the Romans in a later age, was expressed in the line of Lucretius, which has been frequently quoted in this connection, "*Sed prior aeris erat quam ferri cognitus usus.*"

But there is evidence to show that the use of copper was independent of, if it did not precede, that of bronze, particularly in places where the metal was indigenous. This evidence consists in the discovery of copper implements and weapons, instead of or sometimes accompanying bronze, mingled with numerous stone articles of the same character in various places in Europe and the East. The prehistoric people had learned the art of extracting copper from its ore, and in some cases practiced it near the places where the metal was used for implements and weapons. Prehistoric copper mines have been reported from the Urals and elsewhere, and a circumstantial account of such a mine, which was discovered in 1827 near Bischofshofen in Salzburg, in Germany, has been published by M. Much, an archæologist who examined it in 1879.\* The traces of the old workings, nearly obliterated after so long a time, had led to the establishment of a flourishing modern copper mine on the same vein, just as

\*Die Kupferzeit in Europa und ihr Verhältniss zur Cultur der Indogermanen. Wien, 1886.

the trenches on the outcrops of the copper-bearing rocks in the Lake Superior district served as guides to modern miners in sinking shafts there. The Salzburg mine, however, was in copper ore and not native copper, and was a mine in the proper sense of the term, with extensive underground workings. The remains of small smelting furnaces, with slag heaps and other rubbish, were found in the neighborhood, in the midst of which were a few pieces of the copper produced from the ore on the spot by the prehistoric smelters.\* No iron tools or signs of their use were found in this mine, which was assigned by the archæologist who examined it to the time of the neighboring lake-dwellers, who used its copper for weapons and tools. Another mine in the Tyrol, referred to by the same author, was also apparently worked to supply a colony of lake-dwellers situated near by.

It might be expected on both mineralogical and metallurgical grounds that copper would be used before bronze, and even before smelting was discovered, because copper, like gold and silver, is found in the native state in many places, while considerable metallurgical skill is necessary for the production of bronze. Moreover, bronze is an alloy of copper and tin, and, except in the comparatively rare cases where copper and tin ores occur together, tin would have to be transported to the copper smelters to produce the alloy. In North America,† while copper was known to the natives, bronze had not appeared at the epoch of discovery by Europeans, and neither smelting nor even melting was necessary for the production of the copper articles found in use by the discoverers.

The first comers to the northern part of this continent were struck with the absence of metals in the native weapons and implements, and found their place supplied by stone and bone. The inhabitants were in the neolithic stage of culture. They were, indeed, in possession of copper, but, as far as the discoverers observed, it was almost exclusively used for ornamental purposes, and formed, apparently, no part of the native equipment in the arts of life. Exclusive of the Spaniards, the earliest voyagers who left records or reports of their explorations, sailed along the coast, or visited different parts of it, from Labrador to Florida, and the inhabitants of the whole sea-board were found sparingly in possession of the "red metal." Thus, in the account of Cabot's voyage in 1497, given in Hakluyt, there is this brief statement: "Hee (Cabot) declareth further that in many places of these Regions he saw great plentie of copper among the inhabitants." The account is a translation from Peter Martyr, and the words "great plentie of" are not warranted by the original.‡ Cabot's

\*A piece of this copper gave on analysis: Copper, 98.46 per cent; sulphur, 0.09 per cent, slag, 0.44 per cent; while a copper tool found in the workings gave copper 97.78 per cent, nickel 0.88 per cent, iron a trace, lead 0.05 per cent, sulphur 0.24 per cent, slag 0.07 per cent.

†By North America is meant only the non-Spanish portion of the country.

‡Orichalcum in plerisque locis se vidisse apud incolas prædicat.



observations were made on the northern coast of the continent, and he went as far as  $60^{\circ}$  north latitude. A similar brief statement is given in the account of the voyage of Cortereal in 1500, who is said to have gone as far north as  $56^{\circ}$ . The account (in Ramusio) describes the painted inhabitants, their clothing of skins and other particulars, and states that they had bracelets of silver and copper. The mention of silver is unfortunate. Verazano's report goes more into particulars. He coasted from  $34^{\circ}$  to beyond  $41^{\circ}$  north latitude, in the year 1524, and made several landings. He says of the natives at a point on the coast apparently in the neighborhood of New York that they had "many plates of wrought copper, which they esteeme more than golde." On sailing along the coast to the eastward he saw certain hills and concluded that they had some "minerall matter in them, because," he says, "we saw many of them (the natives) have beadstones of copper hanging at their eares." On the southern and eastern coast, therefore, according to these accounts, the copper was used for ornaments. Neither of the observers quoted speaks of copper weapons in that part of the country, which they would have been likely to notice, as they naturally paid special attention to the arms they might have to encounter. Nor did later explorers who described the equipment of the natives in detail have occasion to give greater prominence to copper.

In Cartier's second voyage to the St. Lawrence, in 1535, he kidnapped the principal chief of a local tribe to take with him to France, following the common practice of the time, and this chief was visited on shipboard by condoling members of his tribe, who were assured that he would return the next year, "which, when they heard," says the account in Hakluyt, "they greatly thanked our Captain and gave their lord three bundles of beaver and sea wolves skinnnes, with a great knife of red copper that commeth from Saghenay." Here is an instance of a copper weapon or implement. The quantity of copper which the North American Indians possessed at the epoch of discovery, although the metal was diffused over a very wide territory, was very small compared with stone. A glance at collections of aboriginal articles, like that of the Smithsonian Institution in Washington or the Peabody Museum in Cambridge, will at once show how relatively insignificant it was. The Smithsonian has between six and seven hundred copper articles from mounds, graves and other sources within the territory of the United States, while there are thousands of stone arrow and spear heads and implements in its collection. The Peabody and other copper collections are very much smaller. A closer examination of the Smithsonian exhibit will show that the copper articles from the south and east are mainly of an ornamental character and few in number compared with those found towards the northwest. As Wisconsin is approached the copper articles not only increase in number, but

the proportion of arrow and spear heads and implements far exceeds that of the ornaments. Among the Wisconsin specimens are pieces of "float" copper, varying in size from those weighing several pounds down to nuggets, which indicate the convenient material of which some of the manufactured articles were probably made. If one were to prepare a map showing by shading or colors, as is now the practice, the relative number of aboriginal copper finds in the United States, the deepest shade or darkest color would at present be in Wisconsin. This condition is no doubt largely due to the indefatigable zeal of Mr. F. S. Perkins of Wisconsin, who has devoted himself for many years to collecting copper articles of Indian origin from all parts of the State, over two hundred of which are in the Smithsonian cases. But the phenomenon can be explained in another way when one reflects that Keweenaw Point is directly north of the State and was the seat of the ancient copper mines, which have attracted the attention of archæologists, and was the center of distribution of the native copper which was the object of the desultory mining carried on there. Wisconsin is also in a very favorable situation for receiving the drift which brought "float" copper from the copper-bearing rocks of Keweenaw, which "float" was apparently often manufactured into implements. The State covers a district which was near the mines and is in a direct course for people leaving them going south. It may be found that that district was the seat of the ancient miners themselves.

The yield of mounds, graves and fields, as shown in the collections, confirms in a general way the observations of the first discoverers. In the eastern and southern parts of the country the majority of the copper articles which have been found are breastplates, bracelets, beads, bobbin-like objects and other ornaments, while in the north and west, and especially in Wisconsin, implements and weapons prevail. The Wisconsin specimens are like those figured by Whittlesey (Smithsonian Contributions, XIII), which were found in the mining district itself, and those found at Brockville, Canada, and shown in Wilson's Prehistoric Man. Others, apparently of the same character, are mentioned by Wilson as being found near Marquette, Michigan, east of the copper district.

The present evidence, therefore, shows that copper had not passed its ornamental or precious stage on the seaboard and in the south at the time this continent was brought to the attention of Europe. It was not a part of the general native equipment, either for war, or hunting, or other useful purposes, and its position in the native economy was not like the noticeable part it played in the armament of the Mexicans and Central Americans of the same period.

At the advent of Europeans copper was eagerly sought for in trade with the whites. An official present of copper articles is



particularly mentioned in the account of Cartier's voyage before referred to, and Ralph Lane writes from Roanoke, in 1585, to his company in England that they could not do better than send over copper articles of all kinds to trade with; "copper carryeth the price of all, so it be made red," he explains. The copper obtained from the whites was very soon, with other imported things, disseminated by barter among the different tribes. In Frobisher's third voyage to the Labrador coast (lat. 58°), in 1578, he noticed the evidence of this aboriginal trade, and says "the natives have traffic with other people, and have barres of iron, arrowe and speare heads and certain buttons of copper which they use to weare upon their foreheads for ornament, as our ladies in the Court of England doe use great pearle." This trade with the natives must have been considerable. The fishing fleets which swarmed in the northern waters carried on trade, and copper and iron articles formed a part of their outward cargoes. According to Anthony Parkhurst, who had been in the business and on the fishing grounds, trade to Newfoundland from England was brisk in 1548, and an estimate which he made for Hakluyt shows that in 1578 there were one hundred Spanish vessels engaged in cod fishing, twenty to thirty whalers from Biscay, fifty Portuguese and a hundred and fifty French and Breton vessels. The English contingent was then much smaller than in former years.

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After the arrival of Europeans, bringing an assortment of "novelties" of all kinds, there was no reason why the Indians should trouble themselves further to obtain domestic copper by the toilsome process of searching and digging for it, because they now had not only a ready and sufficient supply of that metal for ornamental purposes, but were introduced to many other things of superior attractiveness, especially iron, in the form of knives, hatchets, etc., which at once superseded copper for practical use. "The Chippewa chief, Kontika, asserted in 1824 that but seven generations of men had passed since the French brought them brass kettles; at which time their people at once laid aside their own manufactures and adopted those of the French."\* The testimony of the earliest voyagers to the possession of copper ornaments by the natives is therefore of importance, because there was very soon enough of the imported article in the country to make a show. Incidentally, also, archæologists have to keep this fact of foreign importation in mind in deciding upon the origin of copper articles in "finds." Lake Superior copper, of which pre-Columbian Indian articles were made, occurs in the native state, and is free from the impurities which are found in copper that has been smelted, so that chemical analysis could often decide whether a given specimen was of

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\*Schoolcraft, Vol. IV, p. 142.

native origin or imported. On some copper articles found in the north, specks of silver have been noticed. This is as sure a token of Lake Superior copper which has never been melted as a stamp could be.

In the absence of evidence that the Indians of the United States had any knowledge of smelting it must be inferred that all the copper they possessed was found in the metallic or native state. There is nothing to show that they were aware of the existence of copper ore as a source of metal. No remains of smelting places, or slag, or other indications of metallurgical operations have yet been found. If they had known smelting they could have had an ample supply of the metal, because ores of copper are comparatively abundant in the United States, while as a matter of fact, copper was a rarity with them. Native copper occurs in small quantities in many places in the United States, but there is no evidence at present that the northern Indians had knowledge of any but two localities where it could be obtained in any quantity. These were the Coppermine River in the British possessions, and the Lake Superior copper district. The latter affords the most remarkable occurrence of native copper in the world, and the present mines on Keweenaw Peninsula—including the famous Calumet and Hecla, the Tamarack, Quincy and others—are of world-wide fame. The same deposits were worked superficially over their whole extent long before the advent of Europeans to these shores.

By referring to the map of Michigan it will be seen that Keweenaw Peninsula is a prominent geographical feature and extends a considerable distance into Lake Superior. Its north-western shore and the continuation thereof through Ontonagon County is practically parallel to the opposite or north shore of the lake. Through the middle of Keweenaw Point runs a belt of elevated land, which is several hundred feet above the lake in some places, and extends from the extreme point through the peninsula and Ontonagon County into Wisconsin. This elevated belt, which is known as the "mineral range," sometimes rises into bluffs, which are abrupt on the southeastern or shoreward side, but sloping in the opposite direction or toward the lake. The dip of the formation (sandstone, and sheets of igneous rock including conglomerates) composing this range is in a general northwesterly direction, or towards the lake and the north shore. On Isle Royale, near the north shore of the lake, the same formation occurs, but dipping in the opposite direction, viz., to the southeast or towards Keweenaw. "Trap" rock carrying copper is also found on the north and east shores of the lake at St. Ignace and Michipicoten Island. The copper-bearing series of the "mineral range" consists of sheets of igneous rocks—diabase, diabase-amygdaloid and melaphyr—which include beds of conglomerate all carrying native copper. Both of these classes of rocks are



mined. The famous Calumet and Hecla mine is in the conglomerate, as is also the Tamarack, while the Quincy, Atlantic, and others are in the amygdaloid rocks. The product of the mines is divided by the miners into three classes, stamp rock, "barrel work" and mass copper. By stamp rock is meant that which contains the copper in fine particles and is sent to the powerful steam stamps to be crushed, in order to separate the grains of copper by washing (jigging), just as gold bearing quartz is stamped. "Barrel work" means the pieces of copper which are large enough to be detached from the rock without stamping, and are packed in barrels and sent directly to the smelters. They vary in size from pieces about as large as the hand to those not too large to be conveniently packed in barrels. Pieces too large for this constitute the third class, "mass copper," which includes the huge pieces of many tons weight, which are occasionally met with. All this copper shows as such in the rock, and the ancient miners had only to follow down a promising outcrop showing "barrel work" for a few feet and hammer away the rock from the copper to secure the latter. When they came upon mass copper they were compelled to abandon it after hammering off projecting pieces, because they had no tools for cutting it up and removing it. Several instances of this sort have been found.

The ancient "mines" were not mines in the strict sense of the word, because they were not underground workings. As described by Whittlesey, who examined them at an early date,\* they were shallow pits or trenches, and sometimes excavations in the faces of the cliffs, scattered along the mineral range from Ontonagon to near the end of the peninsula. At the time modern mining began they had become mere depressions in the ground, owing to the accumulations of earth, leaves and decayed vegetable matter, within them. Forest trees were growing in them and upon the waste thrown out of them, so that it was difficult to distinguish them from natural depressions due to the weathering of the rock beneath the soil, or, in some cases, from the hollows left by the upturned roots of fallen trees. After their character was discovered, however, they served as guides to the modern miners, who often sank shafts upon the copper-bearing rocks, which were revealed by clearing them out. No mine has been opened on the lake that was not thus "prospected" by the old miners. Trenches like those on Keweenaw Point and Ontonagon, but if anything more elaborate, were found on Isle Royale and Sir William Logan mentioned similar workings on the east shore of the lake, near Maimanse. All of these workings contained stone hammers or mauls, amounting in all to a countless number. A few wooden shovels, strongly resembling canoe paddles, were found in some of the diggings, together with the

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\*Smithsonian Contributions, XIII, 1862.



remains of wooden bowls for baling, birch-bark baskets and some spear or lance heads and other articles of copper. In Ontonagon County the old workings were for the most part shallow depressions only a few feet deep. Some of them in the bluff which showed outcroppings of copper rock were hardly large enough to shelter a bear, while others were larger. In Houghton County (*i. e.*, on the Keweenaw promontory) on the Quincy location, there were broad and deep pits in the gravel, probably dug for the float copper, lumps of which are still met with in the neighborhood. At the Central mine, further out on the point, there was a pit filled in with rubbish, which was at first supposed to be natural. It was five feet deep and thirty long. On examination, "a flat piece of copper, five to nine inches thick and nine feet long, was found, which formed part of a piece still in the vein. Broken stone mauls were all about it, showing that the miners could do nothing with it. Its upper edge had been beaten by the stone mauls so severely that a lip or projecting *rim* had been formed, which was bent downwards." Other localities toward the end of the peninsula and at the Copper Falls location are described by Mr. Whittlesey, and as late as 1890 depressions in the ground of small dimensions were pointed out to the writer at the latter place as the work of the old miners. Modern miners would regard the whole system as nothing more than prospecting work and not mining proper, as there were no shafts or tunnels or underground workings of any kind. As Mr. Whittlesey expressed it, "the old miners performed the part of surface explorers."

I am fortunate in being able to add to the foregoing the testimony of an eye-witness of some other discoveries in this district, *viz.*, that of Mr. J. H. Forster, a well-known mining engineer who lived in the district many years. He was at one time superintendent of one of the mines, and was engaged on the Portage lake ship canal as state engineer when the canal was opened, when he discovered some copper articles in an ancient grave at that point. He writes in regard to the discovery of old operations: "The largest mass of float copper found in modern times . . . weighed eighteen tons and contained very little rocky matter. When found in the woods it was covered with moss and resembled a flat trap boulder. It had been manipulated by the 'ancient miner' and much charcoal was found around it. Its top and sides were pounded smooth and marks of stone hammers were apparent. All projections—every bit of copper that could be detached—had been carried away. . . . Subsequent explorations disclosed the epidote lode whence the mass came—torn from its matrix doubtless by the ice. The mass had been transported only about fifty feet and dropped on a ridge. When the lode was stripped of the drift the jagged edges of a mass in place were exposed. It was of the same length, thickness and

structure of the "float." It was observed at the time that if the 'float' could be set up on edge on the piece in place it would fit in exactly." Mr. Forster was present when the famous Calumet conglomerate lode was opened. At that point a small mound was found in the woods, while explorations were in progress, upon which large maple and birch trees were growing. Roots of trees still more ancient were found in the drift. After stripping off the timber, a pit was sunk which reached the solid conglomerate at the depth of fifteen feet. "But it was a hard rock filled with stamp copper only and could not be mined by the ancient miners." Numerous stone hammers and birch-bark baskets were found in the workings. Mr. Forster thinks the dirt was carried out of the pit in these baskets. On the north side of Portage lake, on the extension of the Isle Royale lode (opposite Houghton), the drift being shallow, "long trenches were dug on the back of the lode three feet wide and deep. There was much small mass or nugget copper (barrel work) released by the disintegration of the soft epidote vein stone." This was thrown out, while the earth was thrown behind the miner as he advanced, and the work resembled that of an expert "navvy." A remarkably deep trench was discovered at the South Pewabic (now Atlantic) mine, several miles west of the last locality, which extended two or three feet into the solid rock. At the bottom "was a well-defined transverse fissure vein of quartz, about two feet wide, containing here and there chunks of solid copper. By the several pits sunk on the course of the vein, proof was had that it had been worked superficially several hundred feet in length. I walked through it a long distance. The surface of the formation was shattered and decomposed, hence the old miners could come at the quartz handily. They did not carry the rock out to the surface to dump it, but piled it up neatly on each side of the drift. At one point I found a handsome specimen of quartz and copper laid up carefully in a niche. It weighed several pounds. . . . As in other cases, we had proof that the ancient miner did not sink any shafts and do real mining. He was only a surface gleaner." Of the ancient workings on Isle Royale, on the north shore of the lake, which were very extensive and have been described as extending twenty feet and more in the solid rock, Mr. Forster says: "As I understand it, these extensive works were upon a high outcrop, promising natural drainage. And I should infer from what I heard from Mr. A. C. Davis, the agent, and others who opened the Minong mine\* that the ancient workings were among disturbed shattered rocks, among which were found much mass copper and barrel work. The ancients were after these pieces of copper. Mr. Davis found many considerable masses, handled and beaten by the ancient men, which were too large for them to carry away."†

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\*On Isle Royale. †From a letter to the writer.



At the Minnesota mine, in Ontonagon County, was found a large piece of mass copper which had been raised some distance in the excavation and abandoned by the old workers. As this was the first large mass discovered and gave rise to considerable speculation, it deserves special mention. The account is taken from Forster and Whitney's report on the Geology of the Lake Superior Copper Region, and is as follows: In the winter of 1847-8, Mr. Knapp, the agent of the Minnesota, found an artificial cavern on the mine location containing stone hammers, and at the bottom was a vein with jagged projections of copper. After the snow had left in the spring he found other excavations, and particularly one twenty-six feet deep, filled with clay and a matted mass of mouldering vegetable matter. On digging eighteen feet he came to a mass of native copper ten feet long, three feet wide and nearly two feet thick, weighing over six tons. "On digging around it the mass was found to rest on billets of oak supported by sleepers of the same material. This wood, by its long exposure to dampness, is dark colored and has lost all of its consistency. A knife blade may be thrust into it as easily as into a peat bog. The earth was so packed around the copper as to give it a firm support. The ancient miners had evidently raised it about five feet and then abandoned the work as too laborious. They had taken off every projecting point which was accessible, so that the exposed surface was smooth. Below this the vein was subsequently found filled with a sheet of copper five feet thick and of an undetermined extent vertically and longitudinally. . . . The vein was wrought in the form of an open trench and where the copper was most abundant there the excavations extended deepest. The trench is generally filled to within a foot of the surface with the wash from the surrounding surface, intermingled with leaves nearly decayed." Whittlesey says of this mass: "Its upper surface and edges were beaten and pounded smooth, all the irregularities taken off, and around the outside a rim or lip was formed, bending downwards. . . . Such copper as could be separated by their tools was thus broken off, the beaten surface was smooth and polished.

On the edge of the excavation in which the mass was found there stood an ancient hemlock, the roots of which extended across the ditch. I counted the rings of annual growth on its stump and found them to be two hundred and ninety." Mr. Knapp felled another tree, growing in a similar position, which had three hundred and ninety-five rings. "The fallen and decayed trunks of trees of a previous generation were seen lying across the pits." A shaft was subsequently sunk on the lode revealed by this trench, which was in rich ground, to a great depth. The abandonment of this mass of copper formerly gave rise to conjectures. It was supposed that the ancient miners were interrupted in their work "by some terrible pestilence . . . or by



the breaking out of war; or, as seems not less probable, by the invasion of the mineral region by a barbarian race, ignorant of all the arts of the ancient Mound-builders of the Mississippi and of Lake Superior."\* But from a consideration of the evidence of the character and scope of the old workings which we now possess, it will be seen that it is unnecessary to go so far for an explanation. As was clearly the case at the Central and Mesnard mines, and on Isle Royale, the mass at the Minnesota was abandoned by the old miners because they found it impossible to get any more pieces from it. They had no tools which could cut it, and even at the present time mass copper is the least desirable form in which the metal presents itself in the mines, on account of the labor and expense of cutting it up, although there are steel tools especially invented for the purpose. The practice of hammering off pieces from mass copper is mentioned by visitors to the lake from the French missionaries down to Schoolcraft. There was a large mass on the Ontonagon, which has been in the Smithsonian Institution for many years, which was considerably reduced in size in this way in the course of a hundred and fifty years of casual visits.

A great antiquity has been assigned to these workings by some writers, and it used to be supposed that a busy industry was suddenly interrupted in them at some time over five hundred years ago. The tree with three hundred and ninety-five rings of growth has been used to support an argument that the workings must have been abandoned at least as long ago as the middle of the fifteenth century, or, to be exact, reckoning from 1847, before the year 1452. This would be at least forty years before the voyage of Columbus and eighty-four years before Cartier visited Montreal. Although it may be true that work ceased at the particular trench where that tree was felled at the date indicated, it does not necessarily follow that all the workings were abandoned at the same time. Indeed, the tree which grew on the dump of the pit where the Minnesota mass was found did not begin its growth until over a hundred years later, or after the French had been up the St. Lawrence and there had been considerable traffic with Europeans on the sea coast. How long *a parte ante* the whole system had been worked can only be a matter of conjecture. When one reflects that many hundreds of men were busily engaged for several consecutive seasons, with all the feverish energy born of the modern thirst for gold, in the diggings of any one of the placer camps which are now seen abandoned in Idaho, Oregon and California, it will be apparent that the old miners on Lake Superior must have taken a long time for their leisurely work. Their tools were primitive, their work was desultory, and they knew nothing about the desire of

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\*Wilson. Prehistoric Man, Vol. I, p. 278.

wealth. Primitive peoples do not prosecute any industry persistently and assiduously like civilized men. Where there are no wages, no expenditures, no companies and employes, no stocks or fluctuations of the market, nothing even which can be called a demand, there is no need of pushing a laborious work. It was also, probably, only in the summer, and it may have been only at considerable intervals, that Keweenaw, Ontonagon and Isle Royale were visited for copper. It must also not be forgotten that the ancient miners only carried away "barrel work." They were forced to abandon mass copper. Barrel work from the excavations and float copper from the neighboring and remote drift would furnish the material necessary for all the tools, weapons and ornaments that have been found, and although the quantity of copper from these sources was small when reckoned in tons, yet the desultory and selective kind of mining which produced it, especially if carried on by a comparatively small number of persons over such an extensive territory as the mineral range of Keweenaw, would naturally require an indefinite length of time.









